Texas A&M University - Corpus Christi – Fall 2013
Foundational Approaches to Physical Science
SMTE 3315
Section A: Tuesday & Thursday, 9:30 – 11:25am
Section B: Monday & Wednesday, 2:00 – 4:00pm
Section C: Monday & Wednesday, 4:30 – 6:30pm

INSTRUCTOR: Sabrina Krueger, MS
OFFICE: EN 400
E-MAIL: sabrina.krueger@tamucc.edu

1. COURSE DESCRIPTION:

Foundational Approaches to the Physical Sciences will cover topic subsets from Physics, Chemistry, Earth Science and Astronomy, such as mechanics, gravitation, thermodynamics, electromagnetism, waves, light & optics, periodic table, chemical bounding, earth's atmosphere, basic geology, ground water, the planets and stars.

2. OBJECTIVES:
The mission of SMTE 3315 is to spark interest in the eyes of students, to have students question and analyze the world around them, and to have students think and to have fun, because any science exploration is fun. SMTE 3315 will help students prepare for career in science education. After successfully completing this course you will be able to envision how physical science is applied to the everyday world and be able to solve problems at the conceptual level with the use of basic calculation (+,-,/,*) when needed.

Student's learning outcomes:
1) Conduct simple experiments following scientific method to test a variety of physical science phenomena.
2) Use Metric System for basic measurements with a ruler, a balance, and a measuring cylinder.
3) Describe a motion of an object and explain the effect of force on motion and law of inertia.
4) Gather information about a chemical element from periodic table and describe basic chemical properties of the element from gathered information.
5) Identify and describe physical properties of matter such as density, buoyancy, electrical and thermal conductivity, and magnetic properties.
6) Assemble a simple electrical circuit and be able to do a simple troubleshooting.
7) Discuss different forms of energy and implications of Law of conservation of energy.
8) Describe and explain basic phenomena of the sky such as lunar phases, change of seasons and day/night.
9) Describe the Earth as a system; identify and describe the basic components of Earth system and how they interact with each other.
10) Describe, explain, and discuss the impact of human activities on the nature.
11) Demonstrate problem solving skills and be able to apply the above material to a given situation.
12) Describe/demonstrate/discuss the theoretical and pedagogical methods in teaching the above material to elementary and middle school students.

3. TEXTBOOK:
“Teacher’s Guide to Physical Science” by Reid, Tissot; Kendall Hunt 2009

Supplemental Reading:
a) “Conceptual Physical Science” by Hewitt, Suchocki, Hewitt; Addison Wesley (any edition)
b) www.tea.state.tx.us/rules/tac/chapter112/index.html
4. INSTRUCTIONAL ACTIVITIES AND METHODS:

   GRADES:

Your grade will be comprised of two in-class tests, four online tests, four homework assignments, one practicum, and daily quizzes. Every QUIZ will have one question on material from the current class. You will gain 1 point for attendance just by participating in the QUIZ. The correct answer to the question will earn you an additional point.

The grade breakdown is as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>In-class tests</td>
<td>200 pts</td>
</tr>
<tr>
<td>Online tests</td>
<td>100 pts</td>
</tr>
<tr>
<td>Four homework/projects</td>
<td>100 pts</td>
</tr>
<tr>
<td>Practicum</td>
<td>100 pts</td>
</tr>
<tr>
<td>Attendance</td>
<td>60 pts</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>560 pts</td>
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</tbody>
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How to monitor your progress:

To monitor your progress, calculate the percentage of the grade you have received. For example, 20 points on a homework assignment out of 25 possible points is an 80%. The average of all the calculated percentages is a fair approximation of where you are in class. However, notice the number of assignments and do not make a quick judgment based on a few unsuccessful/successful ones. Please consult me before dropping the class to make sure it is the best thing to do.

Grade Appeals: As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disability and Veterans’ Services: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in CCH 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.
ATTENDANCE AND LATE POLICY:
It is expected that all students will attend class regularly. The curriculum of this class is designed in such way that the major learning comes from activities during the actual class period. Do not be afraid of being late to class. It is better to be late than to be absent. If you miss class, you will lose points for the daily attendance quiz. If there is a reason that you must miss more than one class please talk with me to make arrangements to cover the material. Due dates for all assignments and online tests will be listed in the calendar on the class Blackboard page. If you know you will be missing class, please contact me to make arrangements to turn in work. Late work will be accepted with a 10% per day penalty. Work in electronic format (e-mail) will not be accepted unless prior arrangement has been made.

ACADEMIC DISHONESTY/PLAGIARISM
No form of cheating/plagiarism will be tolerated in this class. If anyone is suspected of academic dishonesty, I will privately speak with this person in an attempt to find a solution to whatever problem is manifesting itself. If anyone is caught cheating on a given assignment/test, a grade of zero (0) will be given and involved parties may be reported to Student Affairs.

GENERAL PHILOSOPHY
This class is meant to be fun and educational. Although it is very important to get a great deal of work done in this course, it is equally important to be human. Therefore asking questions is strongly encouraged. If you do not wish to ask questions in class please come by my office, email me, or make an appointment. Also, related contemporary issues are relevant to the class, so if you’ve found an interesting newspaper clipping or watched a good documentary you would like to share with us, please mention and/or bring a copy with you. Physical Science is a living, breathing subject and is not restricted to the science building or old books with yellowing pages.

STUDENT RESPONSIBILITY
You are responsible for all material presented in class as far as examinations and assignments are concerned. Excused absences will not take this responsibility away.

HOMEWORK
There will be informal homework assigned for practice and formal homework assigned for grade. The answers to all informal homework will be posted on class Blackboard page in each Learning Modules folder. Students must keep up with informal homework to ensure a good grade on the test. All formal homework will require a practical approach from students. Students will conduct simple experiments, grow a crystal, make an electrical maze, and build a fountain. You may work together, but turn in independent and unique reports. The due date for each project is indicated in the schedule below. There are specific requirements for each project; make sure to read and understand each project. If you are unsure about something, please ask. Each project is worth 25 points.

HW#1. A science report. Student will complete a science experiment and write a report. Report will be submitted via Bb. The topic, due dates, rubric and the instructions are on the Bb under assignments.
*By 11:59pm on September 30 for MW, and October 2 for TR, student will submit science report on Blackboard through the official report submission page, or points will be taken off. Submissions by email and Bb messages will not be graded.

HW#2. Crystals of NaCl (table salt) and MgSO₄ (Epsom Salt). Research how to grow these crystals. It is not as easy as it sounds. There is no such thing as perfect instructions. Do not blindly follow the instructions you find – use your knowledge about the subject matter. It is all about the experiment. Do not be afraid to experiment! You must turn in two labeled plastic bags with crystals, one for each type of crystals and submit, via Blackboard, a free format one-page essay summarizing your observation of the crystals’ growth. The due date, the rubric and the instructions are on the Bb under assignments.
*By 11:59pm on October 23 for MW and October 24 for TR, student will submit science essay on Blackboard through the official report submission page, or points will be taken off. *Submissions by email and Bb messages will not be graded.* Students will bring crystals to class on October 23 for MW and October 24 for TR.

HW#3. *An electrical maze* over the Earth and Space TEKS 4-5 grade. Look in the textbook for the building instructions, pg. 111-112. *The design and choice of questions are subjects to grade.* Submit the justification for the choice of questions via Bb. The due date, rubric and the instructions are on the Bb under assignments. * Students will bring maze to class on November 13 for MW and November 14 for TR.

HW#4. *Fountain as a model of a plumbing system.* Use only recycled materials! Instructions for the construction and the due date are posted on Bb. No report is necessary. Students will bring fountain to class on December 9 for MW sections and December 10 for TR section.

**PRACTICUM**

At the end of the semester every student must demonstrate his/her skills to measure length, mass, and volume. The accuracy of measurement done by a student is the subject to grade.

Every student has to be able correctly classify rock (igneous, sedimentary or metamorphic) based on observed properties of the given three rocks.

Every student will have to complete two of the listed below tasks.

1. Make necessary measurements and calculate an average speed of a moving object.
2. Make necessary measurements and identify the unknown solid material by calculated density.
3. Determine the type of three unknown water solutions with use of either cabbage juice, litmus or pH paper.
4. Construct a simple electrical circuit containing a battery, bulbs and a switch according to a diagram.
5. Find requested information about given atom from Periodic Table. Write down names and formulas for the molecules that this element can form with each of four other elements listed in the assignment.
6. Based on the given information make a graph and discuss what conclusion could be drawn from that graph. Read the given graph and make a prediction based on the graph.
7. Construct a lever system. Predict and verify how much effort is needed to lift up given weight with use of that lever system.

**PRACTICUM SCHEDULE**

Section A (TR 9:30) — Practicum on Tuesday, December 17th from 8:00am-10:30am
Section B (MW 2:00)—Practicum on Monday, December 16th from 1:45pm-4:15pm
Section C (MW 4:30)—Practicum on Monday, December 16th from 4:30pm-7:00pm